MINING AND PETROLEUM STANDARD
AND
AMERICAN GAS-LIGHT JOURNAL.

Devoted to Mining, Petroleum, Gas, Water Supply, and Scientific Subjects Generally.

PUBLISHING OFFICE NO. 22 PINE STREET.

VOLUME VIII—No. 11.
WHOLE No. 166.

NEW YORK, MONDAY, DECEMBER 3, ~~1867.~~ 1866

$3 PER ANNUM
IN ADVANCE.

Turnbull's Automatic Gas Purifier.

The machine exhibited in the annexed engraving, purports to be a new, more effectual, and economical apparatus for the purification of coal gas, whereby the operation is performed In a more cleanly and less offensive manner than by the method now in general use. It is more effectual because every particle of the gas and lime (or any other substance it may be deemed desirable to use,) is compelled to come into intimate contact with each other, thereby ensuring complete purification. It is more economical, because the amount of manual labor required in its operation is less than one-third of that required by the process now in general use; also, because it will save a considerable amount of material for the reason explained. It acts also not only as a purifier, but as a "scrubber" and "washer," thereby obviating the necessity of using those vessels. Its construction is simple and not liable to get out of order, and occupies comparatively but little space. It is driven by the same engine that drives the exhauster. This apparatus will recommend itself in a sanitary point of view, owing to its being hermetically sealed, which prevents the escape of any odor or deleterious effluvium.

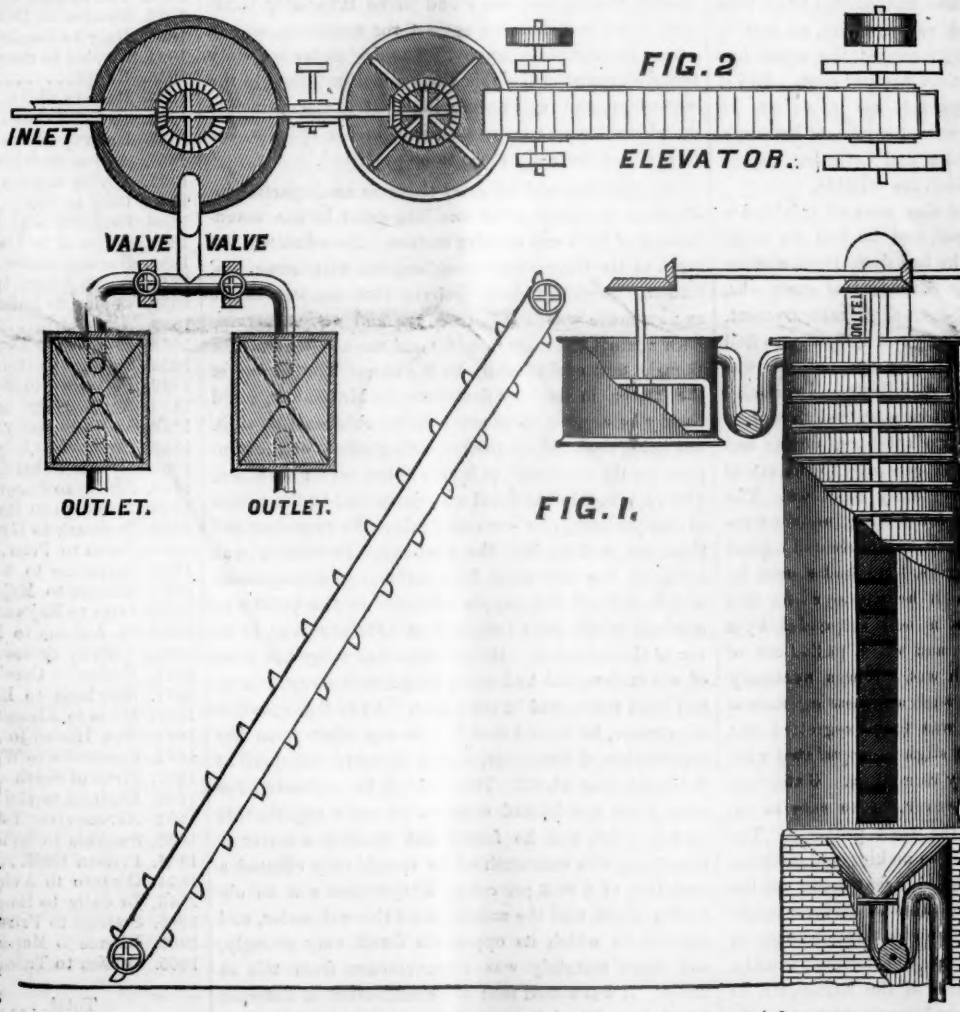

Fig. 1 represents the elevation, with a portion of the outside shell cut away to show the interior.

Fig. 2 is a plan or bird's-eye view of the apparatus, also showing another part of the invention called the "Dryers," by which the gas is freed from all hygrometric moisture and rendered chemically dry, thereby greatly increasing its illuminating power, and entirely preventing any deposition of moisture in the street mains, services, or drips.

The apparatus consists of a vertical iron cylinder, in which is a vertical shaft upon which arms are keyed at intervals, which is made to rotate by means of leveled gearing. Underneath, and as near as possible without touching these arms, are a series of perforated plates, extending from the top to the bottom of the cylinder. In connexion with this cylinder and a little above the level of the top of it, there is a tank in which there is an agitator, which is connected with the cylinder by a pipe made in the form of an inverted syphon, in the bend of which there is a small agitator to prevent any deposit of sediment therein. There is also an elevator with cups in the usual manner, by which finely sifted *slacked lime* is continuously raised and deposited in the tank. Water is likewise allowed to run in a continuous stream into the tank, where the two are intimately mixed by the agitator to about the consistency of milk, and allowed to run in a regulated stream into the first perforated plate in the cylinder, whence it descends from plate to plate in a fine shower to the bottom, the rotatory arms preventing any deposition on the plates, and consequent closing of the holes.

The impure gas at the bottom of the cylinder, forces its way through the holes in the plates, meeting in its course the descending shower of milk of lime, and then escapes through the outlet pipe to the "Dryer," which is composed of two or more vessels made precisely in the same manner as the dry lime purifiers now in common use, on the perforated plates of which *unslacked lime* is placed, which from its strong affinity for water deprives the gas of all its hygrometrical moisture. These vessels are used alternately, the *slacked* lime taken from them being afterwards used in the purification of the gas.

The lime and water saturated with the impurities of the gas, runs off through an inverted syphon, similar to the one before described, into close tanks, whence after the settlement of the impure lime, the liquid portion is allowed to run off through the drain.

In order to prevent the re-absorbtion of water from the gas-holder tanks, the surface of the water inside the gas-holder is covered with a layer of petroleum which entirely prevents any contact with the water.

Meteoric Showers.

The expected Meteoric showers were observed on the night of the 13th ultimo, in England. At the Greenwich Observatory the display is reported by telegraph to the *New York Herald* as having been very brilliant and beautiful, and radiated from the Coustellation Leo, near the star Gamma Leonis, with a direction mostly from east to west. The paths of the meteors were from three to four degrees in the north. Near Ursa Major twenty or thirty were observed at one time, and crossing the Zenith fifty or sixty more of unusual size and duration, the majority being larger than stars of the first magnitude. Nearly all had trails of fire, and some of them exhibited the varied colors of the Solar Spectrum. The display commenced at nine o'clock. At eleven o'clock the maximum was reached, and at three A. M. they commenced to diminish, till daylight extinguished them.

It seems there is a discrepancy in the period that transpired between the great Meteoric shower said to have occurred in 1799. and the two last. Taking 33 years as the proper interval, that of 1833 would have been in 1832, and the next should have been in 1865, instead of the present time. Were it not for the report from England, we would be inclined to the belief that the interval is 34 years instead of 33 years, and we are to wait another year for this remarkable phenomenon, for it is quite certain this side of the world failed to see any unusual celestial display. It may have commenced here after day light, which would go to show that only a portion of the earth was successively subjected to the heavenly shower, as it turned upon its axis.

SHORT-HAND TELEGRAPHIC CODING.—A Captain Bolton has discovered a system of telegraph coding by short hand, which saves from 50 to 400 per cent. in point of time, and it insures accuracy, so that it is not necessary for the clerks to understand the language in which the message is written, and yet they are certain to send it correctly. Moreover, the system is so simple that it can be explained practically in five minutes,

On National Standards for Gas Measurement and Gas-Meters.

By George Glover, Esq.,

Formerly Lecturer on Natural Philosophy, Royal College of Surgeons, Edinburgh, and Vice-President Royal Scottish Society of Arts, and Superintending Medical Inspector General Board of Health, Whitehall.

From the London Journal of the Society of Arts, No. 424.

[continued.]

Coal-gas, like water, has become a necessary of life. It is so more especially in large towns. Its superiority over all other materials for producing light is acknowledged, and the general and persistent demand of the public for gas at a lower rate, and of higher illuminating power, has induced companies again and again to lower its price; some to a point at which it is in vain to expect profit so long as a loose system of measurement prevails, and one-fourth or one-fifth part of the whole quantity produced is allowed to go to waste, and is not paid for. Coal is becoming dearer; labor more expensive. And the question arises—how are dividends to be maintained or improved, and the enormous capital sunk in gas properly protected? The coal cannot be made to produce more gas. Improvements and economy in its manufacture and distribution have nearly reached their limit. The pipes are now more solid than they used to be, while their increased size has enabled the companies to distribute their gas at a lower pressure. The joints, services and fittings have been rendered much sounder and more perfect, so that in gas-works which are properly managed, the actual loss by leakage is probably less than five per cent. And it is daily becoming more apparent, that if gas is to be produced at a remunerative rate, the present loose system of measurement must cease, and imperfect meters must give place to others which are reliable.

Mr. Alexander McIvor said they were all indebted to Mr. Glover for his able paper, and he had no doubt scientific men would admit he had done them service, as well as the proprietors and managers of gas-works, in drawing attention to the subject of gas measurement. It had hitherto been a matter of great difficulty to find the means of accurately measuring gas, and this was only to be arrived at by the most delicate and carefully constructed apparatus. It must be admitted that great success had attended Mr. Glover's labors, for he had given a degree of accuracy and precision to the art of gas measuring which was previously unknown. The gasometer previously in use for testing meters were most imperfect and unsatisfactory, and presented a great many difficulties to gas managers. He had shown by one manager a gasometer which he employed for this purpose, consisting simply of a bell suspended by a pully. It was painted green, and when pulled out of the water it was covered with wet. It was necessary to point out how imperfect such a measuring instrument as that would be. It was to be regretted that many gas managers were but slightly acquainted with the nature of the process they carried on. Until they got suitable instruments, however, in no case he expected that they would do the work properly. The perfection to which the art of gas making and distribution was now brought reflected great credit on the country, and the importance of the manufacturer might be estimated by the fact that the consumption of gas in this kingdom amounted to £6,000,000 sterling annually.

Mr. Chaney said, as an officer of the Exchequer, he begged to thank Mr. Glover for his valuable paper. He wished at the same time to remind the meeting how much they were indebted to Professor Airey, whose name had been so prominently mentioned in the paper, for his labors on the subject. He had devoted much of his valuable time, for a period of thirty years, to the restoration and preservation of our standard weights and measures. They were also indebted to Mr. George Lowe, a famous gas engineer, for the introduction of the decimal system in gas measurement, and to Dr. Frankland, for his valuable investigations into the chemical and physical constitution of gas.

Mr. E. H. Thorman regretted that a manufacturer of wet meters had risen in their defence. He could not quite agree with the sweeping condemnation that had been passed upon those instruments. It was a long time before he became a convert to dry meters. He knew that the public would now, if possible, have dry meters, but he thought the complaints against wet meters were more than experience and practice justified. He believed that the bad cases of error that had been brought forward were quite exceptional, and he regards the wet meter as being very beautiful in its mechanical operation, and in every way worthy of the support of the gas companies.

Mr. C. F. T. Young considered that the defects of the wet meter had not been dwelt upon too strongly, as they immediately became manifest on inspecting one which had been a long time in use. There was a consistant antagonism going on between the materials—iron and brass—of which the mechanical portion of the instrument was formed, and the water in which it worked, and destruction of the parts necessarily ensued. When they reflected upon the fact that so small a difference of level in the water as a quarter of an inch very materially effected the discharge of gas from the meter, it would be seen how important it was, both to the consumer and the manufacturer, that an instrument not liable to such imperfections should be employed. He had heard io asserted by persons well informed on the subject, that wet meters had even been found to register incorrectly to the amount of 60 per cent. In the case of thirty-six meters taken indiscriminately, the register was found to be invariably incorrect, being in some cases against the consumer, and in others against the company. The dry meter certainly removed many of the objections which attached to the wet meter, and which were inherent to the principle on which it was constructed, and in his opinion the former was certainly much to be preferred.

Mr. Hartley said he stood there as an impartial individual, inasmuch as he was interested in the manufacture of both wet and dry meters. He admitted the truth of Mr. Glover's observations, but with some limitation. They were led to believe that the wet meter as now made was liable to grave and serious errors, both against the manufacturer and the consumer. He thought that could hardly be the case. The tilting of the meter in the way described by Mr. Glover, could hardly be carried on to any considerable extent, with, out being detected by the inspecting officer of the company on the one hand, or by the consumer on the other. The variation in the level was permitted to the extent of five per cent., two per cent against the consumer and three per cent against the company. Protection was given to the consumer by a self-acting arrangement which shut off the supply as soon as the point was reached, which gave a register of three per cent. in favor of the company. He had inspected many hundreds of wet meters, but had never found such a variation as had been mentioned in the paper. As to the question of pressure, he denied that it had any effect upon the registration of the meter, unless in increased speed of the measuring wheel. This, indeed, he had tested, for some years ago he had occasion to make experiments on this point, and he found that working a meter at something like one-tenth of its speed, only effected a variation of 2 or 3 per cent. Evaporotion was an objection which told the most against the wet meter, and was one on which its opponents dwelt very strongly, and there certainly was inconvenience from this at times. It was stated that the combination of different metals introduced into wet meters tended to rapid destruction; but they had practical evidence of the long duration of these meters. If there was that strong galvanic overaction which had been referred to, the meters would long since have been destroyed, and would have gone out of use, because the public would have found them not durable. He thought they were therefore, justified in assuming that the wet meter was not so disadvantageous as it had been represented to be. Mr. Glover was mistaken in supposing that all gas-holders were measured by the transferer previous to the passing of the "Sales of Gas Act." He knew that at the present time there were gas-holders that had been graduated by the exact weight of water previously to the passing of that Act; and nothing could be more accurate. There was less difference between them and the Exchequer standards than was permitted by the Act. He had nothing to say against tho dry meter, but he believed that both that and the wet instrument were capable, if fairly used, of doing equal justice to the consumer and the company. If a wet meter were tilted in an unfair manner, they would not expect it to register correctly; it was absurd to expect this as to place a clock an a shelf out of level, and expect the pendulum to act.

(To be concluded in the next number.)

The Submarine Cables of the World.

We subjoin a complete list of submarine cables now in successful working order, the insulated wires for which were manufactured by the Gutta Perch Company of London. It will be seen that they are fifty-four in number, and they are in constant use. We give the date of the laying of the cables, the length of each of the insulated wires, in British statute miles, and the names of the points between which they are laid:

Date.	Route—From	Length of Cable.	Length of Insulated Wire.
1851.	Dover to Calais.....miles	27	108
1853.	Denmark across the Belt.....	18	54
1853.	Dover to Ostend.....	80½	483
1853.	Firth of Forth.....	6	24
1853.	Fortpatrick to Donaghadee...	25	150
1853.	Across River Tay.....	2	8
1854.	Fortpatrick to Whitehead....	27	102
1854.	Sweden to Denmark..	12	36
1854.	Italy to Corsica.....	110	660
1854.	Corsica to Sardinia.....	10	60
1855.	Egypt...	10	40
1855.	Italy to Sicily.....	5	15
1856.	Strait of Canso to Cape Breton	1½	4½
1857.	Norway across the Flords....	49	49
1857.	Across mouths of Danube....	3	3
1857.	Ceylon to mainland of India..	30	30
1858.	Italy to Sicily.....	8	8
1858.	England to Holland.....	140	560
1358.	England to Hanover.....	280	560
1858.	Norway across Fjords.....	16	16
1858.	South Aastralia to King's Isl'd	140	140
1858.	Ceylon to India.....	30	30
1859.	Alexandria.....	2	8
1859.	England to Denmark.....	368	1,104
1829.	Sweden to Goinland.....	64	64
1859.	Folkstone to Bologne.....	24	144
1859.	Across rivers in India.....	10	10
1859.	Malta to Sicily	60	60
1859.	England to Isle of Man.....	36	36
1959.	Suez to Jubal Island.....	220	220
1059.	Jersey to Poroir, France	21	21
1859.	Tasmania to Bass Straits....	240	240
1860.	Denmark to Great Belt.....	28	126
1860.	Dacca to Peru.....	116	116
1860.	Barcelona to Mahon.....	180	185
1860.	Minorca to Majorca.....	35	70
1860.	Iviza to Majorca.....	74	148
1860.	St. Antonia to Iviza.....	76	152
1861.	Norway across Fjoras.....	16	16
1861.	Toulon to Corsica.....	195	195
1861.	Holyhead to Howth, Ireland	64	64
1861.	Malta to Alexandria.....	1,585	1,585
1861.	New Haven to Dieppe.....	80	320
1862.	Pembroke to Wexford.....	63	252
1862.	Firth of Forth	6	24
1962.	England to Holland.....	130	520
1852.	Across river Tay.....	2	8
1863.	Sardinia to Sicily.....	243	243
1864.	Persian Gulf.....	1,450	1,450
1864.	Otranto to Aviona.....	60	60
1865.	La Calle to Basserte..	97¼	97¼
1865.	Sweden to Prussia.....	55	166
1965.	Biserte to Marsala.....	164¾	164¾
1865.	Corsica to Tuscany.....	66	66
	Total.....	6,811	11,020¼
	Total number of cables..		54

A great many cables of short lengths, not included in this list, are now at work in various parts of the world; and other cables, the wires insulated by the Gutta Percha Company, have been laid by Felton & Gueleume of Cologne, during the last eight years, amount to over 1,000 miles, and which are now in working order.—*Exchange.*

—In France a steam carriage for towing boats and barges in rivers and on canals has been invented. It was tried a few days back on the river Oise, and was found to answer perfectly. Running on the towing paths, it makes ascents and descents, and turns as easily as horses do.

Bessemer Steel—Lake Superior Iron.

Various experiments made to determine the tenacity of Bessemer steel, have shown that while wrought iron will bear from 40,000 to 60,000 pounds per square inch, and the best common steel 93,000 to 124,000 pounds, eBsemer steel will resist a pressure about twice that of wrought iron, and nearly as much as the best cast steel. Four experiments with Bessemer steel, as compared with the best common steel, resulted as follows:

No. 1 broke at.....117,183 lbs. per sq're inch.
No. 2 " " .....119,943 " " " "
No. 3 " " .....104,283 " " " "
No. 4 " " .....121,841 " " " "
Best common steel broke at 114,000 " " " "

Borneman says that the softest Bessemer steel is at least as strong as the best Swedish chain iron, and its strength increases with the per centage of carbon to one per cent., when it is equal to about double the strength of the best chain iron.

Experiments recently made in Sheffield, England, with various kinds of steel, show that the absolute strength of any steel increases till it reaches 1.25 per cent., after which it rapidly decreases in strength. These experiments have shown that steel with 9.62 to 0.95 per cent. of carbon, is at least 50 per cent. stronger than wrought iron. Such steel is especially adapted for machinery of all kinds, since it is not made crystalline by repeated jars, as is the case with wrought iron.

In working Bessemer steel, two qualities are observable, which distinguish it from wrought iron; first, it is completely clear of slag, and second, it may be welded at a much lower temperature. When rolled or hammered this steel is completely homogeneous. The rough ingot sometimes have bubbles in them; but since the walls of these bubbles are entirely clear of oxide or slag, they weld together under the rolls or hammer so thoroughly, and when the bar is broken not the slightest trace of them can be found.

It may not be improper in this connection to state that the quality of the Lake Superior iron is conceded to be superior to any iron in the world, as is shown by the following analysis, giving the strength per pound:

Ladsbury, Conn., iron	58,000
Swedish (best)	58,134
English, cable	59,105
Center Co., Pa	50,400
Essex Co., N. Y.	59,960
Lancaster Co., Pa	76,969
Com. English and American	50,000
Lake Superior	80,582

—*Mining and Scientific Press.*

Copper and Gold Mines in St. Domingo.

The following is an extract from a letter written to the *N. Y. Herald:*

I understand that five distinct set of mines have already been denounced and opened by a New York company, and the ore is already coming down by the cart load. One mine, a few miles to the eastward of where the Americans are at work, has been sold to an English company for £15,000 sterling, and a party of English miners is expected soon to commence work.

STATISTICS REGARDING THE MINES.

For the satisfaction of those statistical fellows among your readers who believe nothing unless it comes in the shape of a scientific report, I am permitted to make the following extracts from an official letter to a department of the government:

The already known copper fields extend some twenty miles from east to west, and ten to twelve across to their northern margin. These new features and another class of minerals, among which gold is found in various forms and combinations, supersede the especial sway of copper.

I hesitate to repeat what I have personally seen and positively known of the ore veins permeating these hills in almost every direction. The statements might seem exaggerated, even to those familiar with the ray bed of our Lake Superior or California copper mines. I will, therefore, simply quote a few facts from a late scientific report, dated July 30, 1866, of Engineer Hereschkel.

He there states, with exact truth, that these mountains are threaded by rich veins of copper in such singular abundance, that they can only be compared to the net work of an immense spider web. These veins generally run north from ten to twenty degrees west, but in some cases they range within a few degrees of east and west, most frequently deviating in a descending line seventy to eighty degrees from the horizon. The copper is found in them in the following combinations:

First—Copper appears in carbonate malachite, lapis lazoli. This combination shows as high as seventy-five per cent of metallic copper.

Second—Oxydes, mixed with iron, cobalt and antimony, showing fifty-five per cent. of metallic copper.

Third—Copper pyrltes in various combinations, yielding from twenty-five to thirty-five per cent. of metallic copper.

Fourth—Copper and nickel in various combinations, showing an average of thirty per cent. of copper and four per cent of nickel,

These mineral combinations are found in surrounding rocks of slate, diabar and quartz, which casing contains from ten up to thirty, forty and even fifty per cent. of copper. The presence of nickel and silver in all these combinations is ample to pay the whole expense of mining the ores.

Preserving Timber.

Upon several previous occasions reference has been made in the Journal to the process of preserving timber, invented by Mr. John Bethell, of King William-street, and as the durability secured by the creosoting has now been thoroughly tested, he has prepared a pamphlet stating the results obtained. Mr. Bethell has received some highly satisfactory testimonials with respect to the way in which timber is creosoted by him, but he states that he has reason to believe that since the expiration of his patent much timber has been prepared with less than the proper proportion (7 to 10 lbs. of creosote to the cubic foot) of creosote oil, and that in some cases timber has even been prepared by simply steeping it in creosote oil, but he takes occasion to observe that neither of these practices has been in any way sanctioned by him, and he does not believe they will in any way prevent the internal rotting of the timber. It will be remembered that the process of creosoting requires some care and trouble when properly carried out and it would be a matter of regret if so useful a process should lose its reputation through careless imitations being introduced. The timber being first dried, and cut according to the pattern required, is carefully weighed, and then placed in a cylinder of wrought iron, the doors of which are hermetically sealed. The air and the moisture contained in the wood are then exhausted from it, and from the cylinder containing it, by a powerful air pump. The pores of the wood being now empty, and capable of being absolutely filled, the preservative material, called creosote oil, (which consists of heavy bitumious oils distilled from gas, tar and pitch,) heated up to 120° Fahr., is forced into the body of the timber by powerful hydrostatic pumps, exerting a pressure of 120 to 200 pounds per square inch. This is maintained until it appears that the proper quantity of creosote oil has entered the wood. The wood is then taken out and weighed, to verify the result. From a report to the Legislative Assembly by the Minister of Public Works in Belgium, it appears that although the average durrtion (ascertained during a period of 28 years) of unprepared oak sleepers was 11 7-11ths years and of unprepared fir sleepers 7 7-8ths years, it was found when, in the spring of 1865, a very careful examination was made by the authorities, that all the creosoted sleepers (although some of them had been in use 19 years) were perfectly sound and fresh, and in consequence the Belgian Government decided to have all their sleepers creosoted in future.

—In the refining of petroleum, or of oils obtained from the distillation of coal, etc., at low temperature, it is usual to add sulphuric acid as a preliminary process of refining; and Mr. Fordred, of Blackheath, England, has proposed to substitute a preliminary alkaline process, and the alkaline foots obtained are tseated with steam, and on soil separated, which will be found useful in the arts. The oils thus obtained possesses valuable drying properties, and may be advantageously employed in conjunction with boiled oil, and with such resinous gums and resins as may be soluble therein, and they may be used with paints and varnishes.

The Process of Roasting Ores.

Translated from the German of F. Plattner, for the MINING & PELROTEUM STANDARD AND AM. GAS-LIGHT JOURNAL, by

J. H. TIEMANN.

NUMBER VI.

10. Molybdänglanz (Sulphuret of Molybdenum) $Mo S^2$, by admission of air heated to a red heat and kept at this temperature, decomposos to sulphurous acid, which passes off as a gas and molybdic acid, which, provided the temperature was not high enough to smelt it, remain behind in needle-shaped crytals. These crys tals while hot have a yellow color, but upon cooling are white, the single crystals are translucent. At too high a temperature, for which a bright red only is necessary, the acid smelts to a yellowish-brown liquid, and evaporates more or less, completely as a white vapor. As molybdi c acid readily yields a part of its oxygen to reducing gases, when the temperature in roasting has been only a trifle too high, and the gases allowed to act on the substance, the oxyd only remains, which is not volatile, and has a brownish color.

11. Glaserz (Silverglance) AgS in the form of filings, or made artificially, in the form of a powder, when exposed on a clay saucer in an open muffel, to a heat not sufficient to cause it to sinter, much less to smelt, decomposes with evolution of sulphurous acid to metallic silver, having a dead (matt) appearance, and the particles not adhering together, it may be pulverized in an agate mortar, and has then a metallic lustre. When the sulphuret of silver is in combination with such sulphurets, in small quantities, which have the property, when roasted in a reverberatory furnace, of forming sulphates which are decomposed at a higher temperature, and in such a manner that a part of the sulphuric acid escapes undecomposed, as in the sulphates of copper and zinc, it apparently acts upon the metallic silver formed, converting it into a sulphate of silver. (This will be again referred to further on-)

12. Arsenkies (Arsenical Pyrities) $Fe S_2 + Fe As$ when heated in the form of a powder, and the air admitted, gives off fumes of sulphuret of arsenic before it begins to glow; when it glows, which soon occurs on account of the oxidation, sulphurous and arsenious acids are generated; if the ore is stirred it glows brightly, increases in volume, and is apparently converted into sesquioxyd of iron, which upon cooling, assumes a red color. When this product, however, is examined chemically, it is found to contain traces of sulphate and arsenate of iron, when exposed to a higher temperature, the sulphate only (vide Pyrities and magnetic Pyrities,) is reduced to an oxyd, the arsenate remaining unchanged.

13. Arseneisen (Arsenate of Iron) $Fe^4 A^3$ and $Fe A_s$ at a dark red heat when pulverized and air admitted, soon begin to give off fumes of arsenic, glows gradually, becomes spongy, evolves a great deal of arsenous acid, and generally, in consequence of the presence of arsenical pyrities, some sulphurous acid. If the mass be allowed to cool after all the arsenous acid has been given off, it assumes a dark red color, and consists of oxyd of iron, with a large amount of arsenate of iron.

14. Kupjernickel (Copper Nickel) $N_i^2 A_s$ when exposed to a dark red heat on a clay saucer in an open muffel, changes to a voluminous delicate powder of basic arsenate of nickel, which upon cooling has a yellowish green color, arsenious acid and suboxyd of arsenic.

15. Speiskobalt (Arsenical Cobalt and Nickel) ($C_o N_i$) A_s when finely pulverized and exposed on a clay saucer in an open muffel, to a gradually increasing red heat, is converted into basio arsenate of nickel and cobalt, without perceptible increase in volume, and evolves arsenious acid and suboxyd of arsenic; when cool it has a reddish or yellowish green color, depending upon the quantity of nickel in the mixture.

16. Galena and metallic arsenic in equal quantities (in the place of galena and sulphide of arsenic, which is sometimes roasted in the large way,) when intimately mixed and exposed to a dark red heat in the muffel,

gives off sulphurious and arsenious acids, and not a small quantity of suboxid of arsenic, and is converted into a black looking coherent mass, which is easily reduced to a powder. This mass, when cold, has a dark yellowish gray color, and consists of arsenate and sulphate of lead. If a portion of this powder be heated to redness in a glass tube, open at both ends, it smelts and appears of a dark yellow on the edges, but upon cooling becomes opalescent and translucent.

17. Lichtes Rothgiltigerz (Light ruby silvnr) 3 A_g S, A_s S^3 in a powder, when gradually heated to a red heat in the open muffel, and stirred from time to time, is converted into a spongy, and partly granular mass, evolving at the same time sulphurous and arsenious acid and suboxyd of arsenic, on cooling, the mass becomes brown, having metallic silver interspersed through it, in the shape of fine hairs. At a still higher temperature the mass remains unchanged, and consists principally of arsenate of silver. If, however, during the roasting, the ore be rubbed in an iron mortar from time to time, so that the parts which have become caked are thoroughly mixed with the partially roasted parts, no metallic silver is separated, the whole of the silver is converted into an arsenate, and at a higher temperature remains apparently unchanged.

18. Dunkles Rothgiltig (dark Ruby silver) 3 A_g S, S_b S^3 when roasted under the same conditions as No. 17, is converted into a caked mass, evolving at the same time sulphurous acid and teroxyd of antimony (antimony acid) which wheu cool has a brownish gray color, and contains separated silver in fine hairs. If a part of this mass be rubbed up in an agate mortar and heated to a glow in an open glass tube, a small quantity of sulphurous and antimony acids are again driven off; the mass, when cool, has a light brown or yellowish gray color, and is free from metallic silver; at a middling red heat the mass remains unchanged, passing into metallic silver at a higher temperature, and evolying white fumes of teroxyd of antimony.

19. Fahlerz (Gray Copper) 4 (Cu^2 S, F_e S, Z_n S) S_b S^3 when powdered and exposed to a dark red heat in an open muffel, evolves sulphurous and antimony acids before it comes to a glow, as the oxidation of the different parts increases it glows of itself, accompanied by a brisk evolution of sulphurous and antimony acids, showing a great inclination to sinter. If the caked ore be rubbed in a mortar, and again exposed to the heat, the appearance of fumes of antimony acid last but a short time, while the strong smell of sulphurous acid still continues. By continued roasting, and after being once or twice pulverized in the mortar, the ore loses the inclination to sinter, and the smell of sulphurous acid disappears, and on cooling it has a very dark yellowish green color. If the roasted ore be treated with Hydrochloric acid a green solution is formed, in which may be detected the oxides of copper, iron and zinc, and sulphuric acid, and there remains a pale, reddish, yellow powder, which when washed, dried and ignited, assumes a light yellowish brown color, being about one third of the roasted ore, consisting of oxyd of copper and antimony acid, apparently antimonate of copper.

20. Galena P_bS and Antimonglanz (Sulphide of Antimony) S_b S^3 thoroughly mixed in powder, when exposed to a dark red heat in the muffel, evolves sulphurous and antimony acids, and without sintering. is converted into a yellowish gray mass, which appears to consist principally of antimonate of lead, which when examined chemically however, is found to contain sulphuric acid as well.

Spontaneous Combustion of Coal on Board Ships.

The Committee of Lloyd's Salvage Association has issued the subjoined report on this subject, which has caused the destruction of so many vessels. There are a great many opinions afloat relative to the cause of spontaneous combustion, some ascribing it to the chemical composition of the coal, others to the absence of ventilation, either natural or artificial, while others again consider it is caused by moisture. 1st. As to the chemical composition of coal. Owners know that one kind of coal is more liable to heat than another, and some will not ship that which is dangerous, but others are less scrupulous and ship all kinds. This might be partially checked by obliging owners to deposit at the customs an analysis of the coals sent by them; they would be afraid of having any fire traced to their coal. But a better method is suggested by Mr. R. Hunt, F. R. S. of the Museum of Practical Geology, in England. A machine has for some time been employed for washing away the iron pyrites or bisulphuret of iron from the small coal at the pit's mouth, previous to converting it into coke. While the coal is in transit, the oxgen acts upon the bisulphuret of iron and evolves great heat, consequently, if the iron pyrites were excluded, a great source of danger would be obviated. The cost is only about 6d. a ton for the washing, and would be amply set off by the lower rates of insurance, consequent on greater security. Second. As to natural ventilation. It is chiefly small coal which heats, there being room in large kinds for the air to circulate between the lumps, but as the Chilian consumer requires small coal for smelting purposes, the only remedy is for shippers to send as large coal as can be used. Third. Artificial ventilation. Mr. Hunt proposes a method for securing this, but its efficacy has not yet been proved. It is to let down a pipe in the after part of the ship well into the coal, and to let down one in the fore part with the top communicating with the cook's galley; this would produce an updraught and keep down the temperature of the coal. Fourth. Moisture. Coals are in every way liable to get wet. At the pit's mouth they lay uncovered; in the wagons they are not in any way protected, the expense of tarpaulins being too great. While being shipped the hold is open to the weather, and at sea the hatches are frequently taken off, and the spray and sea air must necessarily dampen them. On the whole the committee commended to those connected with shipping coal that—coal of undue fineness or damp coal should not be shipped. That a rod, similar to those used in British ships, should be used every twelve or twenty-four hours, to ascertain the temperature of the coal. That the proposition of Mr. Hunt for artifieial ventilation should be tried. That the coal should be washed previous to shipping.

Foreign Scientific Items.

[COMPILED FOR THIS JOURNAL BY PROF. HENRY WURTZ.]

X. MEERSCHAUM PIPES.—The mineral meerschaum is well-known to be a hydrated silicate of magnesia, with two equivalents of water. The variety most valued is compact, susceptible of being wrought, and of receiving a beautiful polish. It is almost exclusively employed for making tobacco pipes and cigar holders. A strange announcement has recently been put forth, that it may be substituted for the subnitrate of bismuth in choleraic diseases.

Deposits of meerschaum are very rare, which accounts for its high price. Some veins however, are found in the Paris basin, at Chenevières, near Champigny (Sein-et-Oise), in the department of Gard, in the environs of Madrid, etc.: but these are of little value compared with the article from Asia Minor, being too soft and fragile. The mining of meerschaum is carried on largely at Kiltschik, in Anatolia; the kind found there, though soft and greasy to the touch when fresh, becoming hard and white in the fire. Some obscurity exists still, as to the mode of preparing the crude meerschaum, nevertheless it is known that the pipes made in Anatolia are *moulded*. The crude earth is kneaded and pressed into moulds: the article being then dried in the sun and hardened in the fire. It is then boiled in milk, dried anew and polished. The pipes thus moulded on the spot are, however, little in demand; those wrought in Germany or Belgium, being much more esteemed. The meerschaum which is to be exported is prepared at Konie, moulded into blocks, dried and slightly baked.

After cutting out, the manufacturers are in the habit of submitting the pipes to a preparation with wax, spermaceti or paraffine. The chips are powdered, formed into a paste with water, dried and hardened in the fire. The pipes made from this waste material are, however, of an inferior quality; the first baking to which the material was originally submitted, having produced slight frittage, which renders subsequent cohesion difficult to produce.—*Le Chemist.*

XI. FICTICIOUS MEERSCHAUM.—The manufacture of meerschaum artificially has been the object of many researches. The following method gives very good results when operated by an intelligent and skilful chemist. It is founded simply upon the double decomposition of soluble alkaline silicates by sulphate of magnesia. 1 lb. avoirdupois of sulphate of magnesia is dissolved in about a quart of water. Two quarts of a solution of soluble silicate of density 1.25 is poured into this, both liquids being at about 170° Fahr. The product is a gelatinoras precipitate, which is long washed, first with boiling, then with cold water, until all alkaline sulphate is removed; then poured into a stone or zinc trough and dried at a temperature of not over 1000 Fahr. The mass thus produced is compact, friable, and very similar to the natural meerschaum; and is susceptible of being manipulated and manufactured in the same way as the latter. For some years M. Wagner has obtained good results by a different method. He incorporates with one part of casine (?) six parts of calcined magnesia, and one part of oxyd of zinc. Upon drying this mixture, there results a material of a lustrous whiteness, very hard, susceptible of being cut and polished, and which perfectly simulates natural meerschaum.—*Le Chemist.*

XII. EXPLOSION OF A SEWER.—The Paris newspapers publish an account of a singular accurrence at the entrance of the avenue of the *Champs Elysees.* A car filled with melted asphaltum, with a lighted furnace under it, happened to pass over the opening into a sewer, and a glowing coal fell into said opening. The gas accumulated in the sewer caught fire and an explosion ensued, accompanied by a dreadful noise. A heavy plate of cast-iron covering the opening of the drain was thrown some twenty feet high and broken in two. No further harm having resulted, the thing was looked upon rather as a joke. The cause suggested for the explosion was *sulphurretted hydrogen*, but it was more likely to have been *marsh gas;* unless indeed, there may have been a leaky gas-pipe crossing the sewer; if fire-damps can be thus generated in dangerous quantities in the sewers of a city, it is time the fact were known and investigated in order that proper means of prevention, in the way of ventilation or otherwise may be provided. The production of an artificial earthquake in one of our city streets, might have results more serious than ludicrous.

Banquet to Cyrus W. Field.

The banquet in honor of Cyrus W. Field, the American father of the Oceanic Telegraph, tendered to that gentleman by the Chamber of Commerce of this city, took place at the Metropolitan Hotel on the evening of the 13th ult. The ovation was in good taste and good time and everything passed off pleasantly, and will no doubt be long remembered by the honored guest who has so fully exemplified the type of American perseverance, zeal and enterprise, an enterprise which has, after such varied vicissitudes, succeeded so triumphantly, and so beneficently to science and to the world. The banquet saloon was put in telegraphic communication with various parts of the world, and lighting messages were sent and received during the evening. Among the many toasts given was the following by Mr. Field: "England and America clasping hands across the sea. May this firm grasp be a pledge of friendship to all generations."

—According to a report just issued by a select committee of the Canadian House of Assembly, the copper-bearing series on the north shore of Lake Huron, extends over a surface of two thousand square miles, and nearly the same extent of country on Lake Superior is endowed in the same manner. Iron is also found in considerable quantities.

Correspondence.

Plastic Slate.

NEW-YORK, Nov. 22d, 1866.

To AMERICAN GAS-LIGHT JOURNAL.

We are constantly receiving enquiries from all parts of the country like the following, which we will try to answer from time to time, "in bulk," through your Journal, if it shall be agreeable to you to publish them for the public good.

It may be that other Journals will see in these answers enough of interest to their readers to print them.

EASTON. N. Y. Oct. 16th, 1866.

PLASTIC SLATE ROOFING J. S. Co.

Gentlemen.—In August, 1865, I called on the inventor of your roofing, Wm. L. Potter, at his residence in Clifton Park, to learn something more about Plastic Slate.

Examining his mill roof and various other things to which it had been applied some two or three years previously, I became perfectly satisfied it was superior to all other kinds of roofing material of a mastic character. I have tried to induce men running plaster and other mills, to engage in grinding the Slate, for hundreds of tons of it would be now used right along, could the people purchase and use it themselves. And now to the point—1st, Can they do so? 2d, Does it make any difference of whom they buy it, whether in the State, County, or Town, or out? 3d, Is there anything more to pay for using it than the purchase price? If yea, to whom and where? Please answer by return mail. About the first of Sept. I bought the material of Mr. Rogers and covered a small roof, which has as yet convinced the most fastideous of its reality and worth.

Yours etc.,

ISAAC CRANDELL.

ANSWER.

We like your concise questions; and proceed to answer promptly. "The people," may purchase Slate from any one having the right to sell it in the State, or out, and there will be nothing more to be paid than the purchase money. The right to *sell* is held in *common* by all Licensees of this Co.; but the right to *use* is restricted by State and County lines. Therefore the right to *use* must be obtained of the Licensee of that State, or County, in which you propose to use it.

If you buy Slate of him, the paying for it implies the right to use it.

J. M. ALLEN,
Sec'y, P. S. R. J. S. Co.

NEW-YORK, Nov. 25th, 1866.

AMERICAN GAS-LIGHT JOURNAL.

We get so many letters asking for an individual right to use Plastic Slate upon a single building or two, and others acking for license for Counties that are already leased, that we wish you would tell everybody that we lease by Counties one or more, to one person or firm—that when a County is leased we cease to control it for any purpose except the collection of the rent, (or royalty) and that all the territory *not* designated in our book, or circular, is "To Let."

We send the circular free to anybody, and it tells them all about the material, and how to use it. This is what none of the composition roofers dare to do. They study to conceal their ingredients and manner of making their material; but we strive to have everybody understand ours; and moreover, if a person lives in a County not leased, and wants to use Plastic Slate, we give him free leave to do so till the County is leased.

He should let us know that he is using it, and he must not ask us to *warrant his work*. Though it is as simple as plastering a wall, yet it requires some sense and skill to handle it successfully. Many a botch has been made with it, and more will be, but no one having common sense will blame the material. It can't help itself.

There is much territory still to lease in the southern States, and some in the northern, and in territory that is leased there is often just as good a chance to get into the business as at first, because many Licensees have taken large districts intending to sub-let a part of them, and then sickness, death, and other occurrences frequently produce vacancies, and give a chance, so that no one who wishes to engage in this very healthful and profitable business need be discouraged. If they will learn the trade we can soon find them a place to work. There is a grand chance now open in a city of 250,000 people, in a northern State too.

J. M. ALLEN.
Secretary.

WILLIAMSBURGH, N. Y. Nov. 24, 1866.

EDITORS AM. GAS-LIGHT JOURNAL.

In your last, Mr. E. L. Hammond advances a theory with regard to a peculiar appearance sometimes seen on Plastic Slate Roofs. We disagree thereto, because we have often noticed it on our earlier roofs, where we did no re-mixing of the mastic at all.

We think it arises from thin mastic! too much tar. And our reason—besides the fact that we have always noticed it on roofs where we worked the roof thin—is this. A true, real chemical combination between the slate and some, or all of the component parts of the tar, takes place upon exposure to the air. (perhaps carbonic acid or something else is taken from the atmosphere to complete it.) The proof of this we will give below. This action is slow for its effect is the hardening of the Plastic, and the combination is not complete until the mastic is hard throughout, for otherwise there would be no reason why the mastic should go on hardening. Now, all chemical combinations work themselves in definite and precise proportions of every ingredient. If we have a trifle too much of any one of the combining parts, that quantity will not combine; or will combine with a less proportion of the other body to make a different compound; so that we shall have, instead of one regular product, a mixture of two dissimilar ones When therefore, we mix mastic with too much tar for the slate flour, part of that flour is obliged to combine with less flour than it really needs, two qualities of substances are produced; when spread on a roof, they separate one from the other; and the real plastic slate appears as dead black patches, while the thin or false plastic only shows a glossy surface, and hardens with great difficulty.

We put on a roof once on felt, where the scuttle was of tin, and the painter, without orders, painted this tin scuttle cover with a heavy coat of regular oil paint. We covered both the roof and the painted scuttle with the same mastic, at the same time. The roof is perfect, while the scuttle cover shows these marks all over it. The reason evidently is, that the oil in the paint had entered the tar, and then not found flour enough for both to combine with, so that part of the tar was left free to form this defective mastic, and did it. This false plastic slate is perhaps of not much consequence, except for appearance. It hardens very slowly, but does not sut (being probably kept in place generally by the real plastic slate which has hardened in masses here and there); while it helps to keep the roof tough rather than brrittle. Still, the black, shiny veins—just like those formed on dough which has just risen—are certainly a disfigurement to the roof, and we should by all means try to mix in the true proportions, so as to avoid them.

We have spun this note out so long, that we have not room for the proof of true chemical combination. We may give it next number, with a consideration of the consequences of putting in too little tar.

PARKES & Co.

New Inventions and Ideas.

AERIAL NAVIGATION.—The Aerial Steam Navigation Company of San Francisco, has filed its certificate of incorporation. The certificate states their object to be the transportation of freight, passengers and despatches from place to place through the air. Capital stock $1,000,000, divided into 10,000 shares of $100 each. Trustees—Algernon Smith, Frederick Marriott and James H. Gardner.

DE MAGNETISING.—The curious magnetic polarisation of H. M. S. Northumberland, arising from her having been built north and south, has been destroyed by reversing that position and then demagnetising her by means of two of Grove's batteries.

MAGNETIC IRON.—A new and singular source of magnetic iron has been discovered. It appears that the shavings of iron and steel, and especially the long spirals produced in turning iron on the lathe, are highly magnetic, especially in the case of soft iron. This magnetism is permanent, and M. Greiss, the discoverer, has observed that the south pole is always at the end which is first touched by the tool.

SUGAR FROM COAL.—We have heard of sugar from saw dust before, but now it is said that a chemist has extracted from coal a substance chemically undistinguishable from sugar. He has named it "phenoze."

AN IDEA IN BUTTONS.—Among the new inventions is a button which is fastened to cloth without thread. It is said to consist solely of a button with a wire, to be inserted into the cloth like a cork-screw, and then pressed down flat, so as to form a ring to hold the button to its place. As this invention will enable men to keep the buttons on their shirts, it is calculated to do away with wives altogether.

CIRCULAR SAW AMPUTATION.—A progressive surgeon thinks it is probable the scientific world, and the rest of mankind, will hail with joy the news that a large military hospital has been established at Breslau, on the Oder, in Silesia, by orders of the Prussian Government, in which has been placed, and made ready for immediate use, a circular saw, worked by steam, to be used for the purpose of amputating such limbs of wounded soldiers as the surgeon in charge shall deem best to have removed. "Imagine," says the writer, "the rapidity by which such operations can be performed by this simple process, and the accuracy with which they can be conducted."

ENGLISH STEEL RAILS.—The London and Northwestern Railway Company in England, have already laid sixty-three miles of steel rails on the road, and the work of relaying with steel, instead of iron, is to be continued. On the Great Northern Railway of England steel rails have also been laid at all the principal stations, and on the steepest inclines.

A FRENCH EXPLOSIVE BULLET.—M. Fertuiset, one of the French lion-hunters, who rivals Gerard, has invented an explosive bullet. One of them, of the diameter known in France as No. 16, blew up a strong wooden box divided into three compartments, reducing it to small splinters. The second, No. 8, penetrated through a target made of strong boards, joined together side by side, by means of heavy nails, and forming in the aggregate the thickness of the bulwark of a frigate. This target was pierced, and at the same time blown to fragments. The third shot was aimed at a loaf of bread, which was blown to atoms.

A NEW GERMAN GUNPOWDER.—A German has taken to Paris an inexplosible powder, which is certainly going to make a revolution in this department of war material. This powder, invented by Mr. Neumeyer, of Leipsic, does not explode in the open air when inflamed; it burns up slowly like so much tinder; but it explodes with more explosive force than any other powder, in a closed cavity; it is cheaper than ordinary powder, and may be manufactured anywhere, even on board ship. Experiments are now being made here with this powder, and if all that is said of it be true, everybody will be obliged to have it.

NAVIGATION THROUGH THE AIR.—A society to promote aerial navigation has been organized in London, and it announces its purpose to push forward the science and rescue it from ridicule. The members believe a man can learn to fly, and they hope ultimately to make the balloon serviceable for purposes of navigation.

CAST IRON MAGNET.—To make a cast iron magnet, take a smooth bar of cast iron, place the middle of it to the north pole of a magnet and draw it to the end, repeating the stroke always from the middle to the end, and rubbing in the same way each time. Then place the middle of the bar to the south pole of the magnet and rub toward the opposite end of the bar, repeating as before. Magnets can be made in this way of steel as well as of cast iron, and may be in the form of a horse shoe or star, as well as a straight bar.

HUMBOLDT COUNTY—COAL OIL.—Mattole correspondence of the *Times*, dated August 20th, says: The Davis well has attained a depth of 1,180 feet; the Jeffrey well 840—indications in both unchanged, except perhaps, a little more gas than usual. The Fonner Farm is progressing finely. Every one agrees that prospects here are very flattering. Some of the stock in the Yosemite has changed hands, and the company are going to resume work immediately.....The Union Mattole Oil Company has levied an assessment of $15 per share on all the shares of stock assessable as well as unassessable of the company.

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Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

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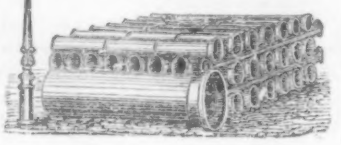

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No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
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No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

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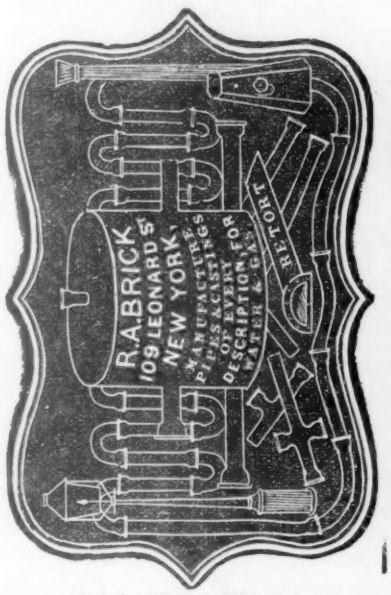

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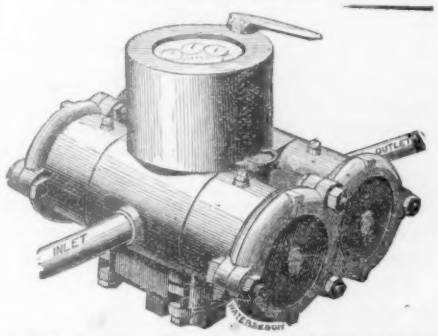

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At No. 22 Pine Street, New York.
BRYANT, CALLENDER & CO.,
EDITORS AND PROPRIETORS.
Profs. Partz & Buck, Consulting Chemists.
MONDAY, DECEMBER 3, 1866.

Wishing to make this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its colums are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

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The Silver State.

Nevada—the Silver State—youngest of all the States forming the American Union, is doubtless the richest of them all in the precious metals. Only a few years ago her territory was supposed to be a vast barren desert, uninhabited, save by the savage Indian and wild beast—a *terra incognita*—unexplored only by the hardy emigrant as he made his weary pilgrimage from the Missouri river to his Mecca-California, or Oregon, turning neither to the right or left, but making his way with rapid strides as possible through the mountain passes, and over the dreary deserts intervening.

None dreamed then that those mountains so wild and uninviting to the eye were vast store-houses of nature filled with millions upon millions of pure shining silver. The man who would have gone to the expense of the legal papers for a free gift of this entire region, would have been reckless indeed.

But in the fall of 1859, a California miner named Comstock, guided by a spirit of adventure, set out solitary and alone on an exploring expedition. Crossing the Sierra Nevada Mountains, he continued easterly a few miles, and finally made his camp, and the discovsry of the now famous Comstock Ledge. And here the history of Mevada, and silver mining in the United States may be said to have commenced. Selecting a few specimens from the croppings, he returned to California. His discovery soon became known, causing great excitement and a general rush in the spring of 1860 for the new mines, then known as "Washoe."

Although the Comstock Ledge was situated very disadvantageously—so far from civilization and every convenience for mining, yet capital and energy soon brought forth the hidden treasures, and in 1861 the Gould & Curry Company produced their first bullion, which soon increased to millions of dollars.

Other companies upon the same ledge; the Ophir, Mexican, Savage, Chollar, Potosi, and many others, have also produced their millious of treasure and made the Comstock famous all over the civilized world, and enriched thousands who had the enterprise and energy to engage in these early undertakings. From the New York Tribune's San Francisco dispatch of Nov. 28th we find that Wells, Fargo & Co. shipped during the preceding week, from their Virginia City and Gold Hill, Nevada, offices alone, assayed bullion valued at $348,344; weekly returns from the Comstock Ledge.

On the very spot where Comstock ate his frugal meal and stretched his weary limbs to sleep, the busy and enterprising city of Virginia now stands, with a population of 22,000 souls, possessing all the comforts and luxuries elsewhere to be found.

The thousands of experienced and hardy miners attracted thither from California, by the reports of the fabulous wealth of the Comstock, judging from the developments made in other silver producing countries, that where one silver ledge is found others exist, started ont in every direction to explore the different mountains and desert plains. Marvellous indeed has been the results. Thousands of ledges have been discovered scattered all over the State, many of which have proven to be more extensive, and many times richer than the Comstock. The result has been that towns and cities have sprung up as if by magic throughout the State. Excellent roads have been made over the Sierra Nevada, placing her citizens within a few hours of California and the City of San Francisco. Railroads are being rapidly pushed forward to completion, under the fostering care of the Government, traversing the State from west to east, on the great route from the Atlantic to the Pacific Ocean. Her rich valleys have been opened up to agriculture; nearly 200 quartz mills have already been erected, which night and day are busy extracting the silver from the ore. A State has been organized and admitted into the Union, and under the protection of the United States, thrift, prosperity and advancement in wealth and greatness is seen in every part of the State.

Humboldt County.—It is now pretty well understood that this county is one of the richest for silver and gold mining in the State. Unionville, the county seat, is situated in the center, and is surrounded almost by a series of rich ledges, many of which are being developed with great success. This place is in telegraphic communication with all the cities in the United States. To the west, some six or eight miles over the ridge of the Humboldt mountain runs the Humboldt River. The Humboldt Canal, now being completed, will furnish a power for reducing and working the ores of this vicinity, and supply the mines with timber from the head of the Humboldt River.

The Washington Mill and Silver Mining Company.—The property of this Company, noticed in our last issue, is located near Unionville, on the west slope of the mountain, and in the center of the famous Argentine belt. It embraces that portian of the "Washington Series" located as the "Madison Campany." A. H. B. Stewart, Esq., the Recorder of Echo District, in which these ledges are located, having visited this section in his official capacity, in a letter to the *Humboldt Register*, speaks highly of this property. He says:

"I next visited the 'Washington Series' owned by the Madison Company; the same series were owned by the Jefferson Company, and the 'American Series' owned by the American Company. These three locations are in a continuous line, and each consist of three veins of quartz, each vein being two and one half feet wide. The ledges in these series are fifty feet apart * * * I have always believed Panther Canon to be one of the richest in these mines, though, as in other localities, capital is required to develop the ledges. * * * Panther Canon affords abundance of water for steam purposes, and contains a large amount of wood."

Hon. M. S. Bonnifield, present candidate for Lieut.-Governor of Nevada, who has reported on several mines for Eastern capitalists, in a report on the "Carson" and "Nevada" ledges, Dec. 1st, 1865, speaks as follows of the Washington Series:

"The companies on the Washington Series have each three ledges, and each ledge is not less than two and a half or three feet wide, all showing the same character of mineral as the Carson. In relation to the mines above named being good, I can say, without hesitation, that I think that all that is required to make them dividend-paying mines are capital and labor."

The Washington Mill and Silver Mining Company's property is being developed by a tunnel running into the side of the mountain, which will strike the ledge at a depth of 200 feet. The work is being pushed forward as rapidly as possible under the supervision of Wm. S. Sargent, Esq., the company's Superintendent. It is calculated the tunnel will be completed and the mine opened within the next three or four months, and the company paying dividends in silver to its stockholders by the first of June next. There is no doubt whatever, but that when opened to the proposed depth, the Washington ledges will yield ore averaging not less than $150 per ton, and that tens of thousands of tons can be taken out and reduced.

The company has a paid up cash capital amply sufficient to complete the tunnel and develop the mine, together with a reserve working capital of $100,000 in the company's stock. The company are offering to capitalists $50,000 of this $100,000 reserve fund, to raise funds to enable them to build a twenty stamp mill, for the reduction of the ore of the company. A mill of this size will reduce twenty tons of ore per day, and allowing $23 as the estimated expenses for mining and reducing, ores paying $150 will net $127 per ton, or $25.40 per day. Calling 300 working days to the year, this will give $762,000 net, annually, to divide among the stockholders, and increase the capacity for reducing ore, as the company propose, to 100 stamps. The company is being conducted in the most economical manner, none of the officers, excepting the Superintendent, receiving salaries.

Water, Etc.

Chicago Lake Tunnel.—The lake tunnel at Chicago has been completed, except the knocking out the bulkhead to let in the water, when thirsty people in the city can have the pleasure of drinking the pure crystal fluid as it is found in Lake Michigan, two and a half miles away, where the fishes undisturbed sport in their native element, unharmed by the turbid waters of Chicago River or the sewerage contaminations of a great city.

Messrs. Dull & Gowan, of Harrisburg, Pennsylvania, took the contract for building the tunnel at $315,139, and the ground was broke March 17th, 1864. Its capacity is such that it will furnish one million people fifty-seven gallons of water each per day.

Water for Cincinnati.—A project has been started to supply Cincinnati with pure water from the Little Miami River, six miles above the city. This is a good movement which will redound to the benefit of the projectors, financially, if it is a private enterprise, and will prove a great blessing to the people of that city, which is but little better off in its supply of pure water than Chicago has been heretofore.

Floating Railway.—M. Freeland of Bordeaux, France, has invented and patented in that country a floating railway. It is described as likely to be of considerable service in loading and unloading vessels in ports having insufficient quayage accommodations, or where the depth of water does not permit ships of heavy tonnage to enter, except at high tide. Such an invention would be of incalculable benefit in this country, if it can be made practicable.

We judge it to be nothing more nor less than a number of pontoons floated into position, so as to form a continuous roadway from the vessel to the shore. Rails are laid upon this, upon which loaded cars can the more readily pass.

The Frazee Life Boat.

This invention seems to be really a valuable life saving invention. Its peculiarity consists in its being two boats in one, or one boat in two, perhaps, is as correct. It is formed of two metallic air-tight cylinders with a flat keel betwcen them, which serves for the bottom of the boat. Each end has a bulk-head and a flat movable false bow which is pivoted, so as to be elevated at an angle to the waves, whichever side the boat is uppermost. Both top and bottom of the boat are similarly rigged with hinged railings, which can be closed down when underneath, or elevated when uppermost, to form the guards of the boat, and sustain the passengers.

When launched or lowered from the davits it must come "right side up with care," or rather without care, for either side is right that happens to come uppermost. It has ample bread and water lockers, and is divided into numerous water-tight compartments; withal it is incomparable, and should be seen to be appreciated. Capt. R. Kingland is general agent, and has his office at 34½ Pine street, N. Y., where a boat is on exhibition.

TURNBULL'S AUTOMATIC GAS PURIFIER.—The excellent illustration on our first page shows at a glance the *modus operandi* of a new method to purify gas, whereby greater economy is attained, and other advantages of equal or greater importance.

The prevention of odor as a sanitary measure is likely to commend it to the municipal authorities. The rendering gas chemically free from moisture to prevent condensation in mains or service-pipes, thereby avoiding the disagreeable consequences arising therefrom, is perhaps not less important. We doubt not Gas companies will examine this invention with interest.

We are in receipt of the first number of the third volume of the MINING AND MANUFACTURING JOURNAL, published at Pittsburgh, Pa., by J. A. Blake, Esq., a journal which we are pleased to place on our exchange list.

Its columns contain a large amount of useful information and is evidently devoted to the interests which it represents.

The price current is also a good feature in connection with the journal, and must be valuable to its patrons and readers. We commend it, and wish for it any success in a worthy enterprise.

STIMPSON'S SCIENTIFIC PENS.—We have tried these pens and consider them a very superior article. In combination with *Stimpson's Fountain Holder*, a cheap and simple article is obtained, which we have never seen equalled for utility and convenience. Whoever trys these pens or holdets, will not willingly do without them.

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And so on at intervals of twenty days leaving on the Saturday previous, when a regular sailing day comes on Sunday.

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Office of the Company, 30 Pine street, New York.

☞ The Mine of this Company rapidly approaching that point of development which will necessitate the erection of a Mill, the Trustees are authorized to dispose of 1,000 shares of the reserve capital stock.

Sealed Tenders will therefore be received at the office of the Company, 30 Pine street, Room 4, till December 20th, 1866, at noon. The Officers of the Company reserve the right to reject all bids under par.

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GAS TAR.

PROPOSALS WILL BE RECEIVED FOR LHE Purchase of the TAR of the ALBANY GAS-LIGHT COMPANY'S WORKS from the 1st January, 1867.

Albany, N. Y., October 20th, 1866. 65-tf

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Gas Lights perfected upon New and Unerring Principles.

REFERENCES:

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At the TRIBUNE ASSOCIATION gas bill reduced upwards of one hundred dollars per month, and better lights given.—SAMUEL SINCLAIR Publisher.

At H. B. CLAFLIN'S, late Claflin, Mellen & Co., gas bill reduced—amount not yet ascertained—but it will be at the same ratio, and light improved.—Mr. BANCROFT.

At WM. SCHIEFFELIN & Co.'s, corner William and Beekman-sts., good light obtained and maintained at all parts of the premises, without additional cost—a result despaired of even by the Gas Co. owing to the deficiency of supply. No deficiency by FIRMIN'S system.

Similar results guaranteed under similar circumstances, or NO CHARGE. 65-88

GAS-METER GLYCERIN.

WE SOLICIT THE ATTENTION OF GAS COMPANIES to our GLYCERIN, which is now generally known, and is undoubtedly the best article ever used for filling Gas meters. Glycerin of 15° Beaume will stand 14° below zero without freezing, and the greater the density the lower the temperature it will stand.

We have sold to most of the large companies throughout the country, and annex a few certificates showing its value:

OFFICE OF THE CINCINNATI GAS-LIGHT & COKE CO., Cincinnati, Ohio, Nov. 25, 1865.

I take pleasure in stating that the glycerin furnished by W. J. M. Gordon & Bro., of Cincinnati, has been used in wet meters by this Company during the past two years, and has proved very satisfactory thus far. Having resisted the action of frost, and not evaporated more than about six per cent. each year.

The standard for density being 15° Baume's scale.

H. I. MILLER, President.

OFFICE GAS-LIGHT CO., BALTIMORE, Dec. 16, 1864.

MESSRS. W. J. M. GORDON & BRO.—Of the numerous fluids used by this Company in their gas-meters to prevent freezing, none have given the satisfaction of the Glycerin manufactured for that purpose by the Messrs. Gordon & Bro., of Cincinnati, Ohio. As Glycerin will withstand a temperature below anything in the latitude of Baltimore without congealing, and as it does not evaporate like the alcoholic mixtures, once filling a meter will last for years. Yours respectfully,

J. MORTON SAUNDERS, Engineer.
COLUMBUS O'DONNELL, President.

Glycerin for Printers' Rollers.

It is coming into general use for this purpose, as rollers will not dry and shrink as when made in the usual way.

OFFICE OF THE DAILY & DOLLAR WEEKLY TIMES, Cincinnati, Nov. 27th, 1865.

I hereby certify that I have used the Glycerin manufactured by the Messrs. W. J. M. Gordon & Bro., of this city, in the manufacture of printing rollers, and find it a most valuable addition to the composition in general use. THOMAS F. WINTER, Pressman Times Office, Cincinnati, O.

November 29, 1865.

We have used the Glycerin manufactured by W. J. M. Gordon & Bro., of this city, for the last seven years. We find it in our line of business—printing playing cards, using colored inks to a great extent,—a very superior and indispensable article. We use about one-sixth quantity of it to the amount of molasses in making our rollers. We find it prevents them from shrinking up, and causes them to retain the desired "tack." We confidently recommend the article for the desired purposes. LONGLEY & BROTHER, Playing Card Manufacturers, Cincinnati, Ohio.

Glycerin is also used by the Cincinnati Commercial and Enquirer, to whom we refer.

We manufacture Glycerine of every quality used, and from our advantage in material we are enabled to sell it lower than any manufacturer in the country.

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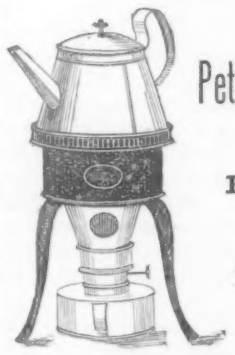

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600	02	150 00	30 00	180 00
750	39	188 00	35 00	223 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	1562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
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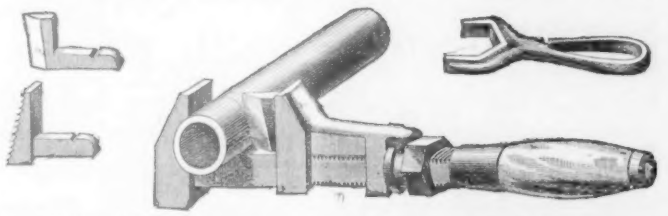

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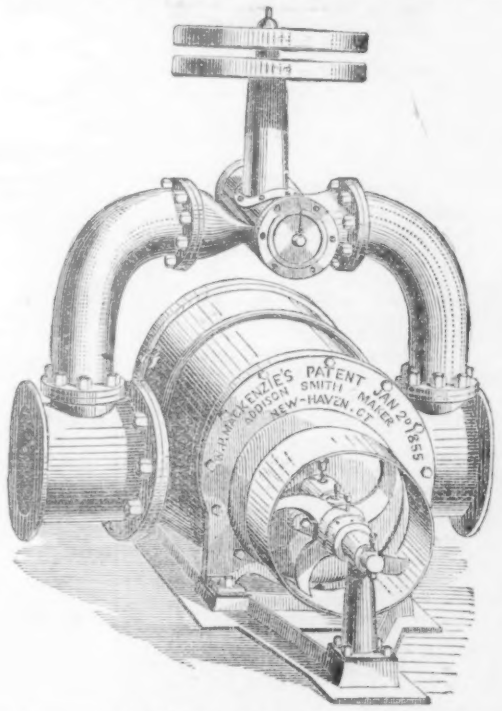

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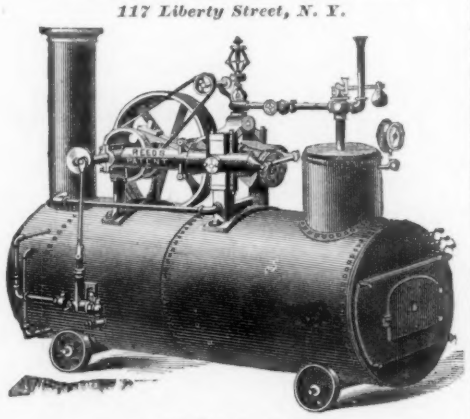
REED & COGSWELL,

CONSULTING ENGINERES,

117 Liberty Street, N. Y.



MANUFACTURERS OF

Slide & Oscillating, Stationary & Portable

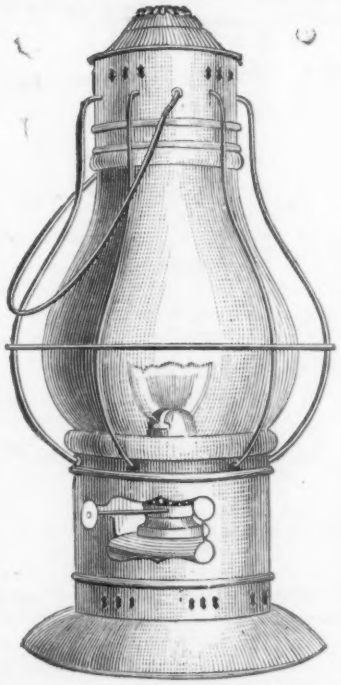
ENGINES,

Of all sizes. Also furnish all kinds of MACHINERY, TOOLS, AND GENERAL SUPPLY. Drawings of all kinds of Machinery executed to order.

JOHN A. REED. [63-86] W. B. COGSWELL.

JAS. O. SMITH & SONS,

MANUFACTURERS of LANTERNS,



81 FULTON, 55 GOLD, AND 90 ANN STREETS, N. Y.

We would especially direct attention to LATE IMPROVEMENTS in our No. 4 SMITH'S LANTERN, (for which we have applied for patent,) having a GLASS LAMP so constructed that the light passes through the bottom of the Lantern; also, the guards are so arranged as to dispense with soldering the top part of the guard to the trimming, obviating the difficulty that so frequently occurs in other lanterns of the guards melting off.

We are manufacturing at our factory, Middletown, Conn., MANY OTHER STYLES AND SIZES, which can be seen at our Show Rooms, 81 Fulton-st., New York. TRIMMINGS, etc., always on hand.

☞ The Trade are invited to call and examine our Stock.

EDDY'S

Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt-saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M. LESLEY,

Manufacturers, No. 605 Sixth Ave., New York.

Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturers,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,

137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Below we give a few prices:

No. 2.	Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2.	Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3.	Extra Oil-Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

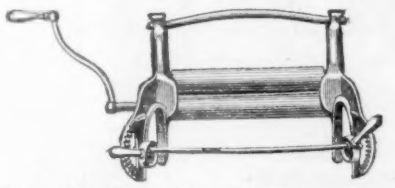
WEED SEWING MACAINE Co.,

136, 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog-wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price.

Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

13 PLATT STREET, New York,

BENNINGTON, Vt.,

CLEVELAND O.

C. GEFRORER,

MANUFACTURER OF

Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.

Burners for Wood, Coal Oil and Water Gas

Gas and Lava Burner Tips

65 *Constantly on Hand.*

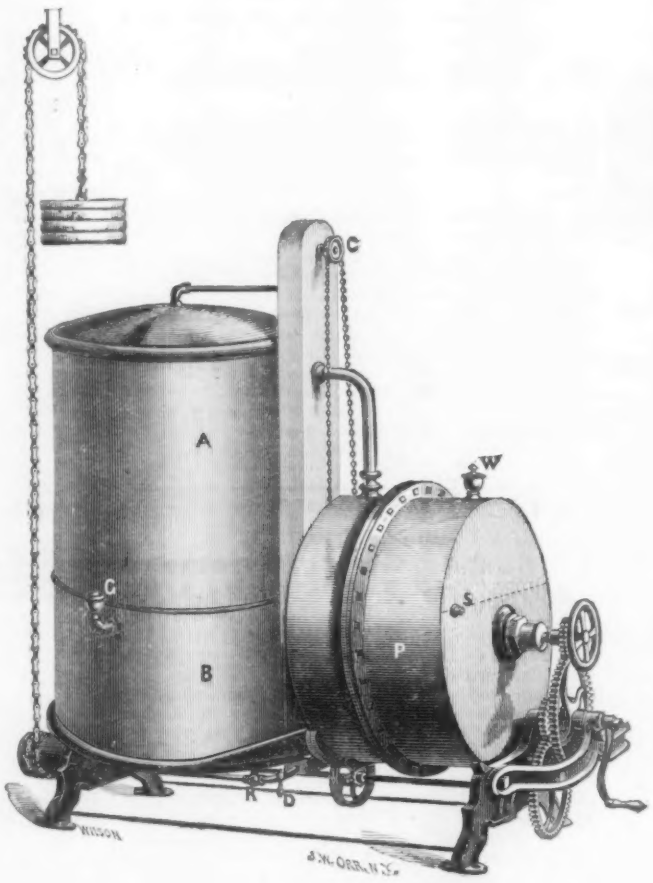
EMPIRE STATE GAS MACHINE,

LEVI STEVENS' PATENT, FOR SUPPLYING,

Dwellings. Stores, Factories and Public Buildings.

THE GAS GENERATED BY THIS MACHINE

Is a mixture of the vapor of hydro-carbon with common air. The mechanical devices employed are such as, from a long experience and critical examination into the nature of the elements brought into use, seem best adapted to secure a certain and satisfactory result. GASOLINE, the liquid employed, is the more volatile portions of Petroleum, of a specific gravity of 0.6587. This liquid exposed to the action of this machine is vaporized, and a close mechanical mixture of the vapor with common air is effected. The value of the gas produced, its permanency, its illuminating quality, and freedom from liability to condensation, depend almost entirely upon the perfect and uniform character of this mixture. Hence the great importance of mechanical means adapted to secure all the conditions requisite in a Portable Gas Machine.



THE PRICE-LISTS OF MACHINES COMPLETE;

(Boxed and delivered on the cars at the Manufactory.)

No. 1,	$150,	5	Argand Burners.
do. 2,	250,	10	do. do.
do. 3,	350,	20	do. do.
do. 4,	450,	35	do. do.
do. 5,	600,	60	do. do.
do. 6,	1,000,	125	do. do.
do. 7,	1,500,	250	do. do.

This machine will produce the most brilliant and steady light without Fire or Heat, and is warranted to operate in every respect as represented.

The EMPIRE STATE GAS MACHINE is the most SIMPLE and EFFECTIVE MEANS KNOWN FOR PRODUCING GAS WITHOUT HEAT.

Its action is automatic, feeding itself with constant supplies of Gasoline, thus securing steady and uniform supplies of Gas. The gas produced is equal to the best known Illuminating Gas. It is as economical as any other, and is adapted to a wider range of use for Lighting, Heatin and Mechanical purposes. It will maintain its illuminating power under as great a degree of cold as any other. It is free from danger with the ordi nary care in using gas. Its remarkably pure and steady light is pleasant for the eye. It renders it easy for persons living remote from street gas pipes to enjoy the luxury of a pure GAS-LIGHT, at a COMPARATIVELY SMALL COST, AND WITH LITTLE TROUBLE.

☞ The public are invited to witness its operations at our store. GASOLINE will be supplied by us, at market prices, or may be obtained from the various other sources of supply now going into operation.

MITCHELL, VANCE & Co., 620 Broadway, New York,

Manufacturers of Chandeliers and Gas Fixtures of every description. Also, Chandeliers, Brackets, Lamps, &c., for Coal Oil, adapted to Churches, Public Buildings, Dwellings, &c.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishmen, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by
HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000. John C. Cresson, Enigneer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entir8 satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. Hookey, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanshipall we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemea, very truly, yours, Birkinbine & Mears.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their orrectness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those mported from Europe, or made by any of the manufactur in the United States. Respectfully Yours George Wiegand, Inspector of Gas Fittings, Philadelphia

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.

Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

GROVESTEIN & CO.,

PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano-Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1,	Seven Octave, round corners, Rosewood,	Plain Case,	$275
No. 2,	" " "	Heavy Moulding	300
No. 3,	" " "	Louis XIV style	325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds. Descriptive circular sent free on application.

Cheeseman's Solid Wood Trays for Gas Purifiers.

Gas purification is one of the most important operations in the process of manufacturing illuminating gas. Slacked Hydrated or Lime is generally employed for this purpose, which is spread in thin layers of two or three inches upon wooden sieves or trays placed in the purifiers, in tiers one above another, with an intervening space. These trays are formed of lattice work or slats, leaving interstices or spaces through which the gas can easily pass and premeate the loosely laid lime, whereby the sulphuretted hydrogen, ammonical gas and other noxious vapors are absorbed, and the gas is rendered less offensive in its odor, and much improved in its illuminating qualities. Iron in various forms has been employed for trays, but the gas soon corrodes and destroys them, and while the first cost is considerable, the frequent replacement necessary makes them too expensive for general use. Wood is generally used, but the integrity or strength of the joinings of the slats and other parts is soon weakened by the action of the gas, and require frequent renewal.

The Cheeseman Gas Trays, herewith illustrated, overcomes this difficulty effectually by having the slats

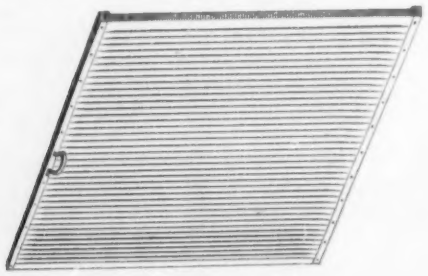


Fig. 1.

Fig. 1 represents the Tray as set in the Purifier.

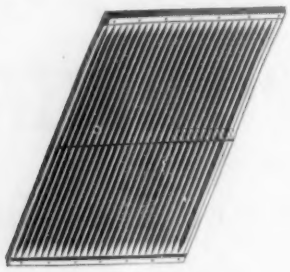


Fig. 2.

Fig. 2 represents a section of the Tray, showing the reverse side and slats.

cut out of solid wood, whereby the ends are left complete and continuous. The slats are cut by machinery, and are uniform, so that the slats on the upper side are close together, while the under side is cut out wider so as to give free passage to the gas, and prevent the lime from clogging. These trays are strong, durable and cheap, and are easily handled and cleaned from the lime, and give an increased purifying surface.

Mr. John L. Cheeseman is the sole proprietor and manufacturer, under the letters patent granted to N. O. Hawshurst by assignment of William Combe, for the conically slatted wood trays or sieves cut from the solid wood, to be used in purifying boxes, which is the most approved purifying apparatus at present in use Orders should be addressed to John L. Cheeseman, 147 Avenue C, New York City.*

* This apparatus was previously described in this Journal, but the cut did not give a correct idea of it. This is a proportional engraving fully illustrating it.

Extracts From the New Tax-Law.

[Especially interesting to our patrons.]

That section twenty-nine be amended by striking out all after the enacting clause, and inserting in lieu thereof the following:—That a special tax shall be, and hereby is, imposed as follows, that is to say:—

19. Coal oil distillers and distillers of burning fluid and camphene shall pay fifty dollars. Any person, firm or corporation, who shall refine, produce or distil petroleum or rock oil, or oil made of coal, asphaltum, shale, peat, or other bituminous substances, or shall manufacture illuminating oil, shall be regarded as a coal oil distiller.

47. Plumbers and gas fittsrs shall pay ten dollars.

Every person, firm or corporation, whose business it is to fit, furnish, or sell plumbing materials, gas pipes, gas burners, or other gas fixtures, shall be regarded as a plumber and gas fitter.

48. Assayers, assaying gold and silver, or either, of a value not exceeding in one year two hundred and fifty thousand dollars, shall pay one hundred dollars, and two hundred dollars when the value exceeds two hundred and fifty thousand dollars, and does not exceed five hundred thousand dollars, and five hundred dollars when the value exceeds five hundred thousand dollars. Any person or persons, or corporation whose business it is to separate gold and silver from other metals or mineral substances with which such gold or silver, or both, are alloyed, combined, or united, or to ascertain or determine the quantity of gold or silver in any alloy or combination with other metals shall be deemed an assayer.

40. Miners shall pay ten dollars. Every person, firm, or company who shall employ others in the business of mining for gold, silver, copper, lead, iron, zinc, spelter, or other minerals, not having paid the tax therefor as a manufacturer, and no other shall be regarded as a miner; provided, that this shall not apply to any miner whose receipts as such shall not exceed annually one thousand dollars.

That section nitety-four be amended by striking out all after the enacting clause, and inserting in lieu thereof the following:—That upon the articles, goods, wares and merchandise, hereinafter mentioned, except where otherwise provided, which shall be produced and sold, or be manufactured or made and sold, or be consumed by the manufacturer or producer thereof, or removed for consumption, or use or for delivery to others than agents of the manufacturer or producer within the United States or territories thereof, there shall be assessed, collected, and paid the following taxes to be paid by the producer or manufacturer thereof. That is to say:—

On candles of whatever material made a tax of five per centum ad valorem

On gas, illuminating, made of coal wholly or in part, or any other material, when the product shall not be above two hundred thousand cubic feet per month, a tax of ten cents per one thousand cubic feet; when the product shall be above two and not exceeding five hundred cubic feet per month, a tax of fifteen cents per one thousand feet; when the product shall be above five hundred thousand and not exceeding five millions cubic feet per month, a tax of twenty cents per one thousand feet. And the genetal average of the monthly product for the year preceding the return required by law shall determine the rate of tax herein imposed. And where any gas wo.ks have not bean in operation for the next year preceding the return as aforesaid, then the rate shall be determined by the estimated average of monthly product; Provided that the product required to be returned by law by any gas company shall be understood to use, in addition to the gas consumed by said company or other party, the product charged in the bills actually rendered by the gas company during the month preceding the return; and until the thirtieth day of April, eighteen hundred and sixty-seven, all gas companies whose price is fixed by law are authorized to add the tax herein imposed to the price per thousand feet on gas sold, and all such companies which have heretofore contracted to furnish gas to municipal corporations are, in like manner and for the same period, authorized to add such tax to such contract price; provided further, that all gas furnished for lighting street lamps or for other purposes, and not measured, and all gas made for and used by any hotel, inn, tavern, and private dwelling house, shall be subject to tax whatever the amount of product, and may be estimated; and if the returns in any case shall be understated or under estimated it shall be the duty of the assistant assessor of the district to increase the same as he shall deem proper. And provided further, that gas companies located within the corporate limits of any city or town, whether in the same district or otherwise, or so located as to compete with each other, shall pay the rate of tax imposed by law upon the company having the largest production. And provided further, That coal, tar and ammoniacal liquor produced in the manufacture of illuminating gas, and the products of the re-distillation of coal tar, and the products of the manufacture of ammoniacal liquor thus produced, shall be exempt from tax.

On illuminating, lubricating, or other mineral oils marking not less than thirty-six nor more than fifty-nine degrees Baume's hydrometer, the product of the distillation, re-distillation, or refining of crude petroleum, twenty cents per gallon: and all such oils between the specific gravity, by Baume's test, of thirty-six and fifty nine degrees, inclusive, shall be deemed refined illuminating oil; and any person or persons who for the purpose of sale or consumption, shall mix any of the heavier paraffine oils with such illuminating oils, or with naptha, or either one with the other, shall be deemed manufacturers of illuminating oil, and taxed as such; and said oil thus mixed, either with or without further distillation, shall be subject to a tax of twenty cents per gallon if after said mixing or distillation, the prnduct marks by Baume's hydrometer, between said points of thirty-six and fifty-nine degrees, inclusive.

On illuminating, lubricating, and other mineral oils, marking not less than thirty-six nor more than 59 degrees Baume's hydrometer, the exclusive product of the refining of crude oil produced by a single distillation of coal, shale, asphaltum, peat or other bituminous substances, not otherwise provided for, ten cents per gallon,

On oil, naptha, benzine, benzole, or gasoline, marking more than fifty-nine degrees Baume's hydrometer, the product of the distillation, re-distillation, or refining of crude petroleum, or of crude oil produced by a single distillation of coal, shale, asphaltum, peat, or other bituminous substances, a tax of ten cents per gallon; provided, that distillers and refiners of illuminating, lubricating, and other mineral oil, naptha, benzine, benzole, or gasoline, shall be subject to all the provisions of law applicable to distillers of spirits, with regard to special taxes, bonds, returns, assessments, removing to and withdrawing from warehouses, liens, penalties, forfeitures, drawbacks and all other provisions designed for the purpose of ascertaining the quality distilled, and securing the payment of taxes so far as the same may, in the judgment of the Commissioner of Internal Revenue, and under regulations prescribed by him, be deemed necessary for that purpose; And provided further, that distillers and refiners of coal and mineral oil whose product shall not exceed twenty five barrls per day on a monthly average, shall not be required to make returns oftener than once in thirty days.

Mining Items.

The Georgia Gold Fever.—The Athens (Ga.) *Watchman* says the gold excitement in the upper counties still continues unabated—indeed, seems to be increasing. It is confined chiefly, we believe, to Hall, Lumpkin, Dawson, and White counties. In Lumpkin and Hall, sales of celebrated mines have been made at high figures. Among the recent sales in the latter county, that of the "Glade mine," has attracted much attention, as it is believed to be very rich. It is believed there are other rich mines in the same neighborhood. We were lately shown specimens of gold found on the adjoining tract, which were certainly very rich, and we learn that from the signs it is believed to be very abundant.

Gold Mining in New Hampshire.—The gold mining company which was formed at Hartford, Ct., last year, with a capital of $200,000, has purchased 1,300 acres of land in Lisbon, Bath and Lyman, N. H., and sunk a shaft in the latter town 79 feet deep, from which they took out about 900 tons of quartz, which yields from $20 to $1300 of gold per ton. They are now employing twenty-five men, with favorable indications of valuable discoveries.

DEC. 10, 1866.